

I claim:

Sub 1. A method of creating a split tree for representing an input tree and at least one tree fragment obtained by splitting the input tree, wherein the input tree

5 comprises a plurality of nodes, said method comprising the steps of:

determining which of the plurality of nodes fit into each galley target; and

marking the nodes that fit into each galley target with a mark specific to the galley target so as to create the split tree in which each tree fragment is identified by respective mark.

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2. The method according to claim 1, wherein said determining step comprising the steps of:

setting one of the plurality of nodes as a current node for a galley target;

checking whether the current node has already been marked;

15 comparing the size of the current node with available space in the galley target if the current node has not marked; and

deciding that the current node fits into the galley target if the size of the current node is not greater than the available space.

20 3. The method according to claim 2, further comprising the step of updating the available space by decreasing the size of the current node if it is determined that the current node fits into the galley target.

4. The method according to claim 2, further comprising the steps of:

determining whether the current node has at least one child node if the size of the current node is greater than the available space;

setting one of the child node as the new current node if the current node has at least one child node; and

5           recursively executing said checking, comparing, and deciding steps with respect to the new current node.

10           5.       The method according to claim 4, wherein in said step of setting the new current node, a first node and a second node are set as the new current node, sequentially, when the current node has two children nodes.

15           6.       The method according to claim 4, wherein in said marking step, the current node is marked with a special mark if the size of the current node is greater than the available space and that the current node has no children nodes.

20           7.       A method of splitting a split tree into at least one tree fragment, wherein each of the tree fragment is associated with a mark specific to the tree fragment and the split tree comprises at least one node marked with the mark, said method comprising the steps of:

            identifying the at least one node marked with the mark; and  
            creating each tree fragment from the nodes marked with the mark specific to the tree fragment.

8. The method according to claim 7, wherein said identifying step comprising the step of searching the at least one node in the split tree for the node with the mark specific to the tree fragment.

5 9. The method according to claim 8, wherein said searching step comprising the steps of:

setting one of the at least one node as a start node;

checking whether the start node is marked with the mark specific to the tree fragment; and

10 completing the search if the start node is marked with the mark specific to the tree fragment.

10. The method according to claim 9, further comprising the steps of:

15 checking whether the start node has already been marked if the start node is not marked with the mark specific to the tree fragment;

determining whether the start node has at least one child node if the start node has not been marked;

setting one of the child node in place of the start node if the start node has at least one child node; and

20 recursively executing said searching step with respect to the set child node.

11. The method according to claim 10, wherein in said step of setting one of the child node, a first node and a second node are set sequentially, when the start node has two children nodes.

12. The method according to claim 7, wherein said creating step comprising the step of performing a predetermined function on the nodes marked with the mark specific to the tree fragment.

5 13. Apparatus for creating a split tree for representing an input tree and at least one tree fragment obtained by splitting the input tree, wherein the input tree comprises a plurality of nodes, said apparatus comprising:

determining means for determining which of the plurality of nodes fit into each galley target; and

10 marking means for marking the nodes that fit into each galley target with a mark specific to the galley target so as to create the split tree in which each tree fragment is identified by respective mark.

14. The apparatus according to claim 13, wherein said determining means  
15 comprising:

setting means for setting one of the plurality of nodes as a current node for a galley target;

checking means for checking whether the current node has already been marked;

20 comparing means for comparing the size of the current node with available space in the galley target if the current node has not marked; and

deciding means for deciding that the current node fits into the galley target if the size of the current node is not greater than the available space

15. The apparatus according to claim 14, further comprising updating means for updating the available space by decreasing the size of the current node if it is determined that the current node fits into the galley target.

5 16. The apparatus according to claim 14, further comprising:  
child node determining means for determining whether the current node has at least one child node if the size of the current node is greater than the available space;  
second setting means for setting one of the child node as the new current node if the current node has at least one child node; and  
10 controlling means for recursively executing checking by said checking means, comparing by said comparing means, and deciding by said deciding means with respect to the new current node.

15 17. The apparatus according to claim 16, wherein said second setting means sets a first node and a second node as the new current node, sequentially, when the current node has two children nodes.

20 18. The apparatus according to claim 16, wherein said marking means marks the current node with a special mark if the size of the current node is greater than the available space and that the current node has no children nodes.

25 19. Apparatus for splitting a split tree into at least one tree fragment, wherein each of the tree fragment is associated with a mark specific to the tree fragment and the split tree comprises at least one node marked with the mark, said apparatus comprising:

identification means for identifying the at least one node marked with the mark; and

creating means for creating each tree fragment from the nodes marked with the mark specific to the tree fragment.

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20. The apparatus according to claim 19, wherein said identification means comprises search means for searching the at least one node in the split tree for the node with the mark specific to the tree fragment.

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21. The apparatus according to claim 20, wherein said search means comprising:

setting means for setting one of the at least one node as a start node;

checking means for checking whether the start node is marked with the mark specific to the tree fragment; and

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completing means for completing the search if the start node is marked with the mark specific to the tree fragment.

22. The apparatus according to claim 21, further comprising:

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mark checking means for checking whether the start node has already marked if the start node is not marked with the mark specific to the tree fragment;

child node determining means for determining whether the start node has at least one child node if the start node has not been marked;

second setting means for setting one of the child node in place of the start node if the start node has at least one child node; and

controlling means for recursively executing search said search means with respect to the set child node.

23. The apparatus according to claim 22, wherein said second setting means sets a first node and a second node sequentially, when the start node has two children nodes.

24. The apparatus according to claim 19, wherein said creating means comprising function means for performing a predetermined function on the nodes marked with the mark specific to the tree fragment.

25. A computer program product including a computer readable medium incorporating a computer program for creating a split tree for representing an input tree and at least one tree fragment obtained by splitting the input tree, wherein the input tree comprises a plurality of nodes, said computer program product comprising:

means for determining which of the plurality of nodes fit into each galley target; and

means for marking the nodes that fit into each galley target with a mark specific to the galley target so as to create the split tree in which each tree fragment is identified by respective mark.

26. A computer program product including a computer readable medium incorporating a computer program for splitting a split tree into at least one tree fragment, wherein each of the tree fragment is associated with a mark specific to the tree fragment

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